California Monthly Climate Summary
May 2013

Weather Highlights

May 2013 was another warm and dry month for California. According to the Western Region Climate Center's California Climate Tracker, the monthly average temperature was 62.0°F which is 2.5°F higher than the long-term average of 59.5°F. This was the 17th warmest May since 1895. With a statewide average of 0.48 inches, precipitation in May was only 54% of average. While this is only the 39th driest May in the California Climate Tracker record, this is the driest January to May with a total of 3.86 inches of precipitation. The mean for this period is 13.65 inches. The previous record low was in 1924 when 5.88 inches was recorded. Regional maximum and minimum temperature and precipitation plots for May and for the January through May time period are shown at the end of the document.

May started with high pressure dominating the State. Warm and dry conditions combined with some wind helped fuel fires across the State. At the end of the week a system retrograding out of the Great Basin brought thunderstorms to the Sierra and southern Cascades some of which spilled into the Central Valley. The second week saw a weak low pressure system cross the State bringing cooler temperatures and showery weather. The following high pressure system brought warmer temperatures statewide by the weekend. This high pressure lasted most of the third week of the month with hot and dry conditions covering the State. A low pressure trough moved through later in the week cooling temperatures and brought isolated showers. Gusty northerly winds followed the exit of this trough as high pressure built in. Week four saw another trough move through keeping temperatures down to some extent. The month closed out with an active weather system that brought rain to the northern part of the State.

Preliminary records, reported on the National Weather Service Record Event Report, show that statewide there were 98 temperature records tied or broken and 4 precipitation records set for the month. Of the 98 temperature records set, 57 were for new high maximum temperatures and 41 were for new high minimum temperatures. Records were set over 12 days of the month. Bishop tied its latest start to a calendar year to record precipitation on May 6th when 0.11 inches fell. The previous year precipitation didn't fall until May 6th was in 1972. On May 2nd, high temperature records were set across the State. Eureka recorded a high of 73°F which broke the old record of 69°F set in 1998. Oakland recorded a high of 90°F which broke the old record of 84°F set in 1992. Monterey recorded a high of 83°F which broke the old record of 82°F set in 1970. Camarillo recorded a high of 96°F which broke the old record of 92°F set in 1970. El Cajon recorded a high of 92°F which broke the old record of 87°F set in 2011. On May 6th, Chula Vista tied a 1927 precipitation record with a daily reading of 0.14 inches. On May 12th, Riverside tied a 1927 record with a high temperature of 103°F. On May 13th, Elsinore set a new high temperature of 105°F which broke the 1927 record of 104°F.

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For the California Data Exchange Center's (CDEC) network of temperature gages used in this report, 128 stations recorded a minimum temperature below freezing during the month while 18 stations reached or exceeded 100°F at least once during the month. Statewide extremes from the CDEC network of temperature gages are shown below. Also shown are the monthly average extremes from the CIMIS network. A table of regional average minimum, mean, and maximum temperatures from the CDEC stations is also shown at the end of the summary.

Precipitation in May was below average across most of the State with the exception of the South Coast and North Lahontan Regions. For the CDEC precipitation gages, the largest amount of precipitation recorded for the month was at Bear Trap Meadow in the Tulare Lake region with 3.11 inches. This is 164% of the average precipitation for this station for the month. At the other end of the spectrum, 13 stations recorded no precipitation for the month. For the CIMIS network, Lompoc in Santa Barbara County topped the precipitation charts with 5.13 inches for the month and 46 stations recorded no precipitation. Some CIMIS gages may show large precipitation totals if the gages are not covered during irrigation activities so care should be given to review precipitation data used from this network.

The 8-Station Index for northern California precipitation recorded 1.3 inches in May. On average, 2.1 inches of precipitation is recorded for the 8-Station index for the month. For the combined January to May total, the 8-Station Index is 9.3 inches which is the lowest Jan-May total in the period of record which dates back to water year 1921. The previous record was 11.1 inches set in 1924. Statewide, the average precipitation for the month was 68.2% of the long-term average based on the California Data Exchange Center (CDEC) gages. Precipitation percentages by region from the CDEC gages are shown in a table at the end of this document.

CoCoRaHS Update

May 2013 continues California's fifth year with CoCoRaHS – the Community Collaborative Rain, Hail and Snow Network. This group uses citizen volunteers to record rain, hail and snow data. The users enter the data online at the CoCoRaHS web site. The web site provides the opportunity to see spatial detail of rain and snow patterns. A map from May 7, 2013 is shown at the end of the document. As of the end of May, California has 1029 volunteers signed up spanning 53 of California's 58 counties. The counties without volunteers are Alpine, Colusa, Glenn, Modoc, and Tuolumne. The county with the most volunteers at the end of May is Sonoma with 98 volunteers. San Diego County is close behind with 90 volunteers. For the month of May, 10,078 reports were recorded for California. The largest daily rain total for CoCoRaHS- CA in May was in Tehama County where 2.40 inches was recorded on 05/17/2013. There were 2 snowfall reports recorded with the largest being 1 inch in Placer County. The largest total depth of snow reported in May was 14 inches in Placer County. One hail report was submitted in May in Mono County. The largest stone size reported was 1/4". To join CoCoRaHS or find more information, please visit http://www.cocorahs.org.

Snowpack and Water Supply Conditions

At the end of May the Northern, Central and Southern region snowpack held 0 inches of snow water equivalent (SWE) as measured by the automated snow pillows. The last nonzero reading for the regional snow pillow report was on 5/28/2013. The Water Supply Index (WSI) for WY2012 for the Sacramento Basin fell into the below normal category and the San Joaquin fell into the dry category. The median forecast for the WSI for the Sacramento Basin is dry and critical for the San Joaquin Basin. Further information can be found at http://cdec.water.ca.gov/water_supply.html. A historical listing of water year categories for both basins can be found at http://cdec.water.ca.gov/cgi-progs/iodir/WSIHIST.

Drought Monitor and Seasonal Outlook

The maps for California for April 23, 2013 and May 28, 2013 are shown below. The Drought Monitor maps can be found on the National Drought Mitigation Center's (NDMC) website http://drought.unl.edu/dm/. These maps are largely a reflection of precipitation and soil moisture deficit estimates. As of the May 28th depiction, 46.25% of California is depicted in the D2 or severe drought category, 51.91% of California is depicted in the D1 or moderate drought category. An additional 1.84% of the state is depicted as D0 or abnormally dry. Maps are updated weekly.

The U.S. Seasonal Drought Outlook for June through August from NOAA depicts California in persisting or developing drought throughout the state. This forecast is based primarily on climatology and forecast models. Maps and information can be found at http://www.cpc.noaa.gov/products/expert_assessment/seasonal_drought.html. Updates are provided twice per month.

For more information on water conditions in California, visit http://www.water.ca.gov/waterconditions/. A table showing end-of-month reservoir storage by hydrologic region is shown at the end of this document.

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ENSO Conditions and Long-Range Outlooks

The El Niño/Southern Oscillation (ENSO) is currently in neutral conditions. Equatorial sea surface temperature anomalies for the tropical Pacific have been near normal with values of -0.2°C in the Niño 3.4 at the end of May. The March through May 3-month running mean of the Ocean Niño Index (ONI) is -0.2. Five consecutive ONI values need to be below the threshold o f -0.5 for conditions to be classified as a La Niña event (five consecutive values above the 0.5 threshold need to be observed for classification as an El Niño event). Most forecast models have the tropical sea surface remaining near neutral conditions for the rest of the calendar year. More information can be found at the Climate Prediction Center's web site: http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ Updates are posted weekly. The latest three month outlook (June through August) from NOAA indicates a higher probability of above normal conditions for the south and

eastern half of the State and equal chances of above or below normal conditions for the rest of the State. For precipitation, a higher probability of below normal conditions is forecast for the far northern parts of the State and equal chances elsewhere. Outlook plots and discussions can be fount at http://www.wrcc.dri.edu/longrang/. General weather information of interest can be found at http://www.noaawatch.gov/. For anomaly information please see http://www.wrcc.dri.edu/anom/cal_anom.html.

Agricultural Data

May 2013 saw further crop planting and development and some harvests. Winter wheat was being dried for harvest with 90% rated good to excellent. Rice fields continued to be planted with 75% emerged and conditions rated 95% good to excellent. Emerging plants were developing quickly due to warm weather. Alfalfa continued to be cut and baled. Grapes were being thinned and vines trained. Apricots, cherries, nectarines, plums, and peaches trees were being harvested. Blueberries and strawberries were picked and packaged. Pomegranates were in full bloom while the olive bloom neared completion. Almond, walnut, and pistachio orchards were irrigated and treated for pests. Curly top virus was a problem for tomato fields in places and some fields were re-planted. Broccoli was planted in Stanislaus County. Peas, lettuce, onions, garlic, squash, fava beans, and radishes were being harvested. Summer vegetable planting began and in some areas fruit was already setting. Range conditions were reported to be in fair to poor condition. Most livestock have been moved from their winter range. Cattle were moved to irrigated pasture as range conditions deteriorated and supplemental feeding continued. For further crop information see http://www.nass.usda.gov/index.asp.

Other Climate Summaries

California Climate Tracker (new product of Western Region Climate Center)
Golden Gate Weather Service Climate Summary
NOAA Monthly State of the Climate Report

Statewide Extremes (CDEC)

High Temperature – 110°F (Buttercup, Colorado River Desert)
Low Temperature – -4°F (Casa Vieja Meadows, Tulare)
High Precipitation – 3.11 inches (Bear Trap Meadow, Tulare)
Low Precipitation – 0 inches (13 stations)

Statewide Extremes (CIMIS)

High Average Maximum Temperature – 97.2^0F (Salton Sea East, Imperial County)
Low Average Minimum Temperature – 32.1^0F (Big Bear Lake, San Bernardino County)
High Precipitation – 5.13 inches (Lompoc, Santa Barbara County)*
Low Precipitation – 0 inches (46 stations)
*Sometimes irrigation water from sprinklers gets counted as precipitation if the gage is not covered.

Statewide Precipitation Statistics

Hydrologic Region	Region Weight	Basin Reporting			Stations Reporting			% of Historic Average	
		Basins	May	Oct-May	Stations	May	Oct-May	May	Oct-May
North Coast	0.27	5	4	4	17	9	8	68.2%	82%
SF Bay	0.03	2	1	1	6	1	1	5.4%	79%
Central Coast	0.06	3	3	3	11	4	4	16.0%	59%
South Coast	0.06	3	3	3	14	12	12	196.4%	49%
Sacramento River	0.26	5	5	5	41	26	26	73.0%	86%
San Joaquin River	0.12	6	6	6	24	12	11	47.2%	70%
Tulare Lake	0.07	5	5	5	28	21	20	74.5%	59%
North Lahontan	0.04	3	3	3	13	6	6	104.3%	81%
South Lahontan	0.06	3	2	2	15	5	5	47.0%	44%
Colorado River	0.03	1	1	1	6	4	3	0.0%	65%
Statewide Weighted Average	1	36	33	33	175	100	96	68.2%	74%

Statewide Mean Temperature Data by Hydrologic Region (degrees F)

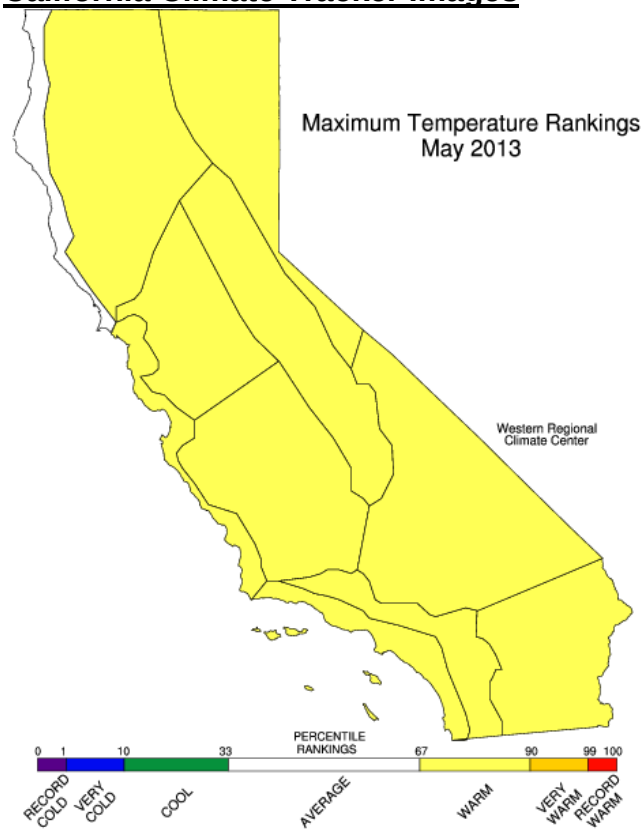
Hydrologic Region	No. Stations	Minimum	Average	Maximum
North Coast	19	29.7	55.0	85.0
SF Bay	9	39.8	60.0	87.3
Central Coast	10	38.3	62.3	93.7
South Coast	37	45.0	64.6	95.7
Sacramento	74	32.4	58.1	85.3
San Joaquin	41	34.0	55.7	82.6
Tulare Lake	20	26.8	48.2	73.2
North Lahontan	26	25.3	45.9	69.1
South Lahontan	15	30.4	52.4	78.5
Colorado River Desert	6	53.2	79.1	104.7
Statewide Weighted Average	257	33.0	56.8	84.8

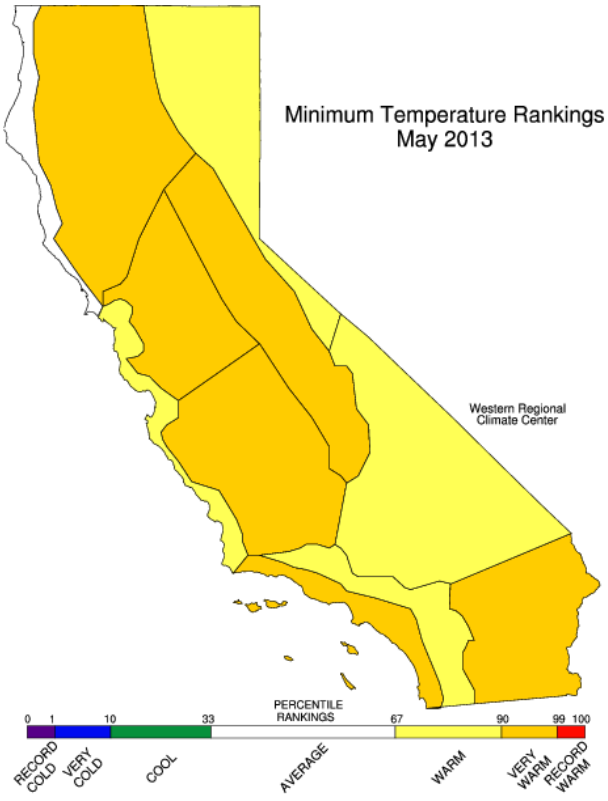
End-of-May Reservoir Storage by Hydrologic Region

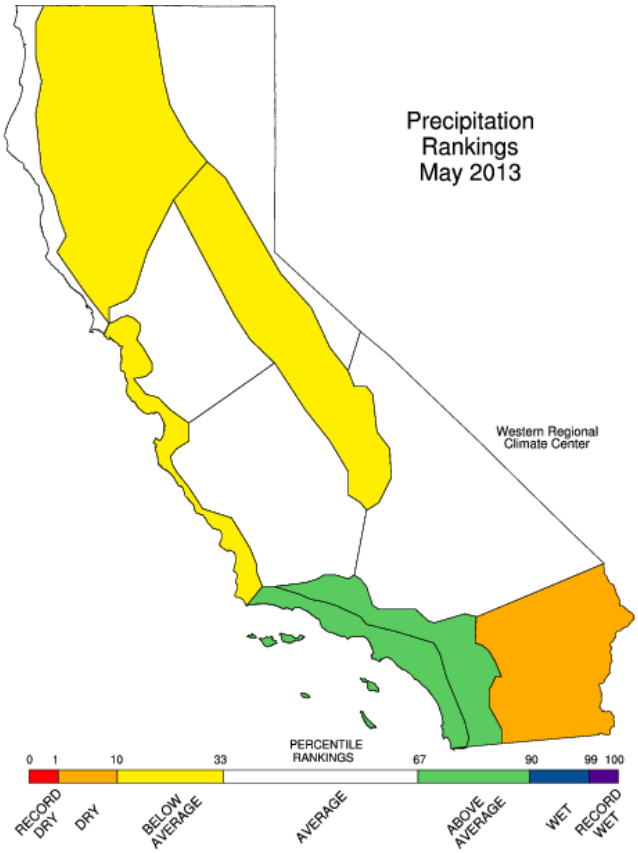
Storage in Thousand Acre-Feet (taf)

End-of-May Reservoir Storage	Number of Reservoirs	Average Storage (taf)	2013 Storage (taf)	% of Average
North Coast	6	2,550	2,367	93%
San Francisco Bay	17	515	440	85%
Central Coast	6	694	454	65%
South Coast	29	1,515	1,221	81%
Sacramento	43	13,519	12,380	92%
San Joaquin	34	8,303	7,138	86%
Tulare	6	1,366	866	63%
North Lahontan	5	653	610	93%
South Lahontan	8	269	258	96%
Total	154	29,387	25,738	88%

California Climate Tracker Images






Precipitation
Rankings
May 2013
Western Regional
Climate Center
PERCENTILE
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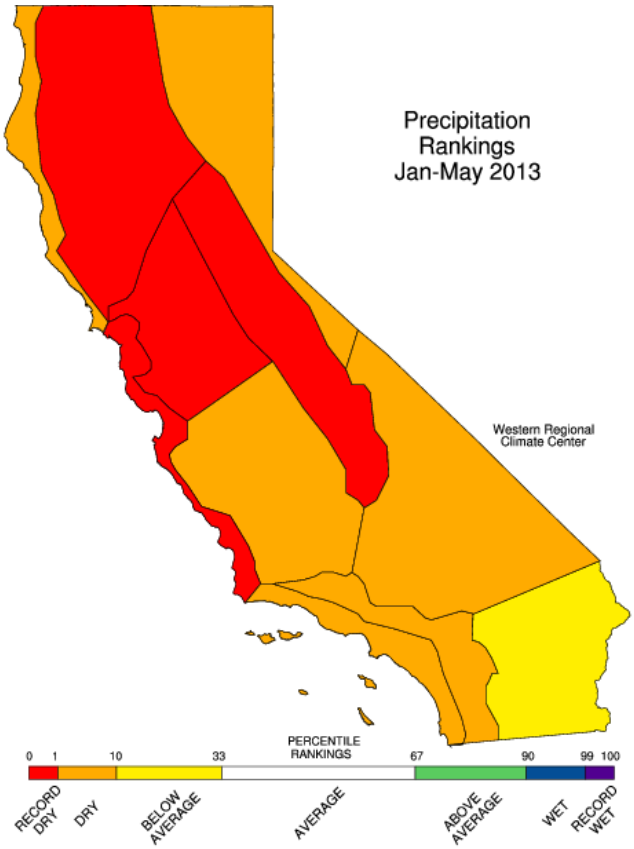
DRY
BELOW AVERAGE
AVERAGE
ABOVE AVERAGE
WET
RECORD WET


Precipitation
Rankings
Jan-May 2013
Western Regional
Climate Center
PERCENTILE
RANKINGS
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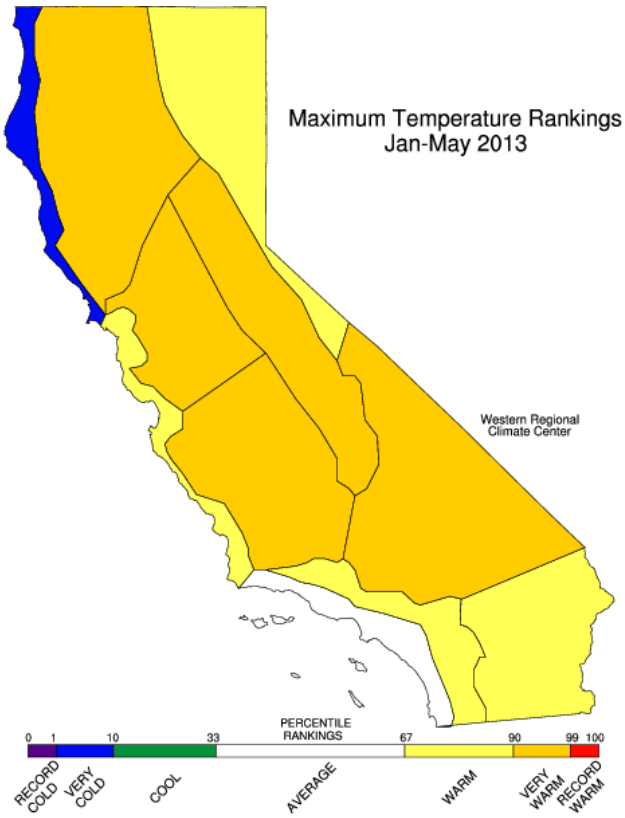
DRY
BELOW AVERAGE
AVERAGE
ABOVE AVERAGE
WET
RECORD WET


Maximum Temperature Rankings
Jan-May 2013
Western Regional
Climate Center
PERCENTILE
RANKINGS
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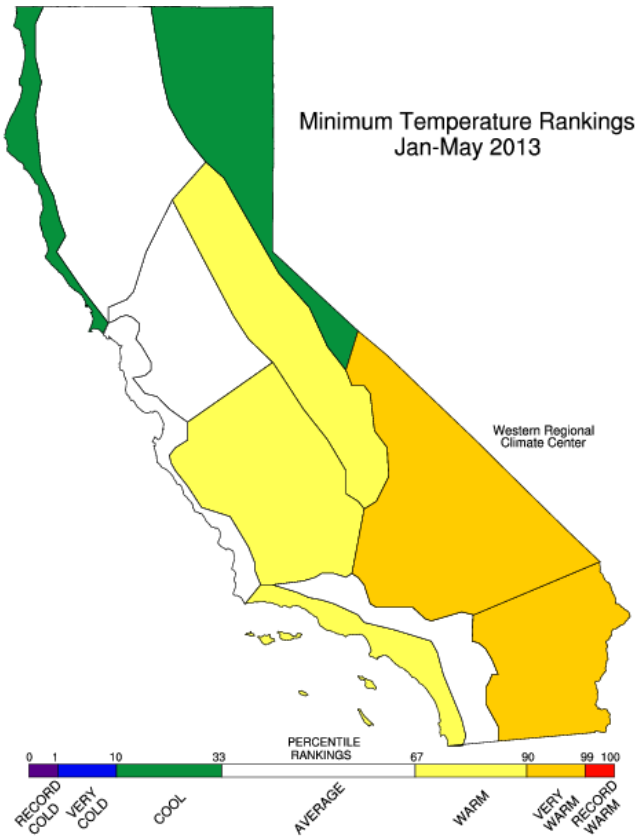
VERY COLD
COOL
AVERAGE
WARM
VERY WARM
RECORD WARM


Minimum Temperature Rankings
Jan-May 2013
Western Regional
Climate Center
PERCENTILE
RANKINGS
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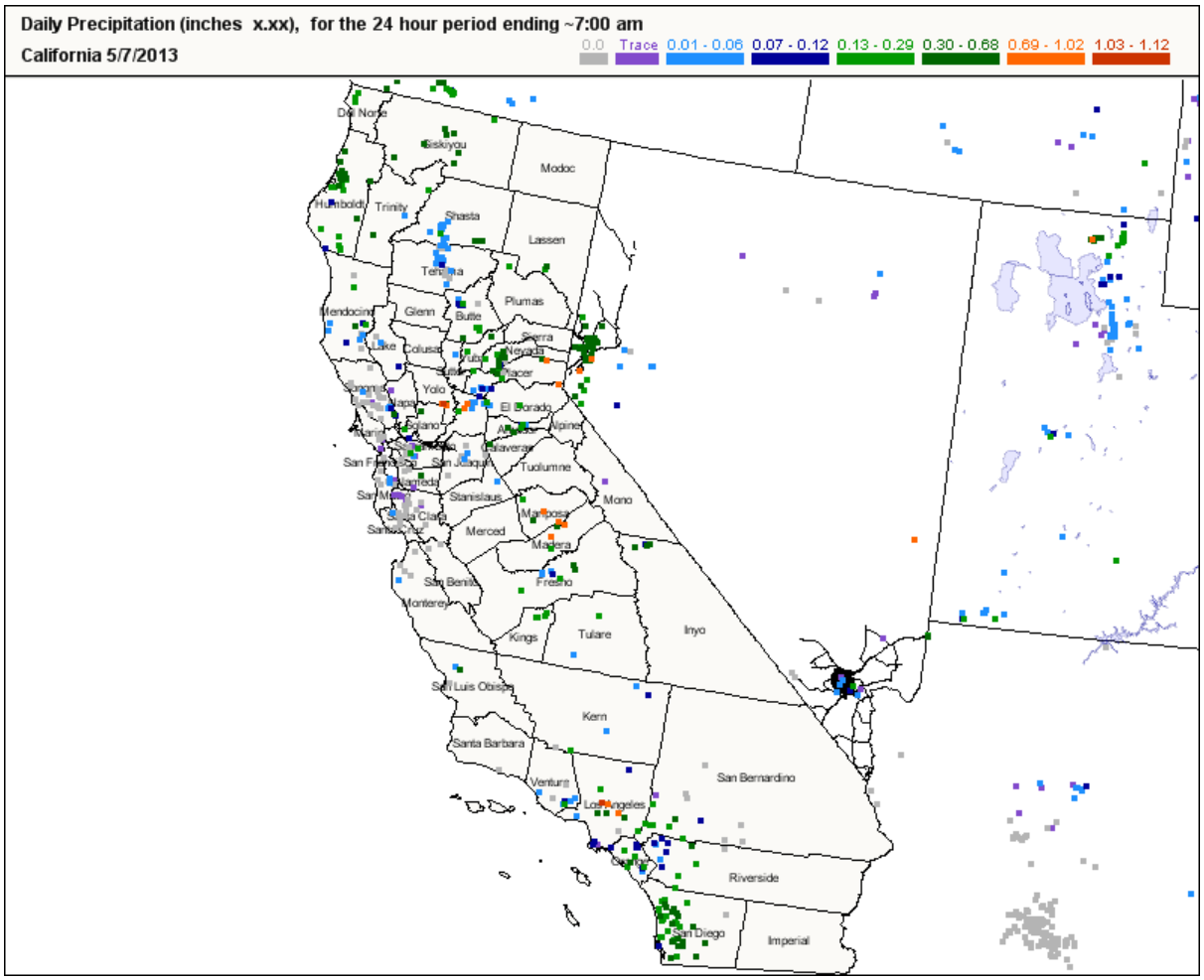
RECORD COLD
VERY COLD
COOL
AVERAGE
WARM
VERY WARM
RECORD WARM

CoCoRaHS Map



U.S. Drought Monitor

April 23, 2013
Valid 7 a.m. EST

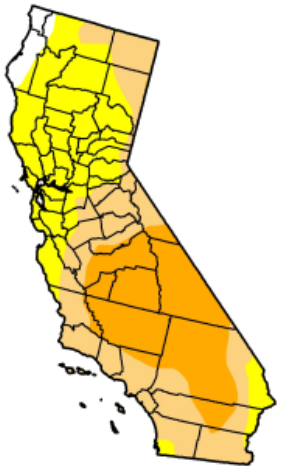
California

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	2.84	97.16	63.42	30.00	0.00	0.00
Last Week (04/16/2013 map)	2.84	97.16	48.39	23.22	0.00	0.00
3 Months Ago (01/22/2013 map)	34.20	65.80	53.58	21.57	0.00	0.00
Start of Calendar Year (01/01/2013 map)	31.75	68.25	55.32	22.50	0.00	0.00
Start of Water Year (09/25/2012 map)	11.95	88.05	69.41	22.27	1.14	0.00
One Year Ago (04/17/2012 map)	15.84	84.16	60.23	26.35	0.00	0.00

Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://droughtmonitor.unl.edu

Released Thursday, April 25, 2013
Eric Luebehusen, U.S. Department of Agriculture

U.S. Drought Monitor

May 28, 2013
Valid 7 a.m. EST

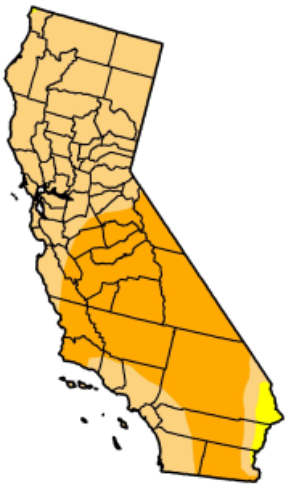
California

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	98.16	46.25	0.00	0.00
Last Week (05/21/2013 map)	0.00	100.00	98.16	46.25	0.00	0.00
3 Months Ago (02/26/2013 map)	0.02	99.98	47.13	26.96	0.00	0.00
Start of Calendar Year (01/01/2013 map)	31.75	68.25	55.32	22.50	0.00	0.00
Start of Water Year (09/25/2012 map)	11.95	88.05	69.41	22.27	1.14	0.00
One Year Ago (05/22/2012 map)	15.89	84.11	58.89	22.60	0.00	0.00

Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://droughtmonitor.unl.edu

Released Thursday, May 30, 2013
Brad Rippey, U.S. Department of Agriculture